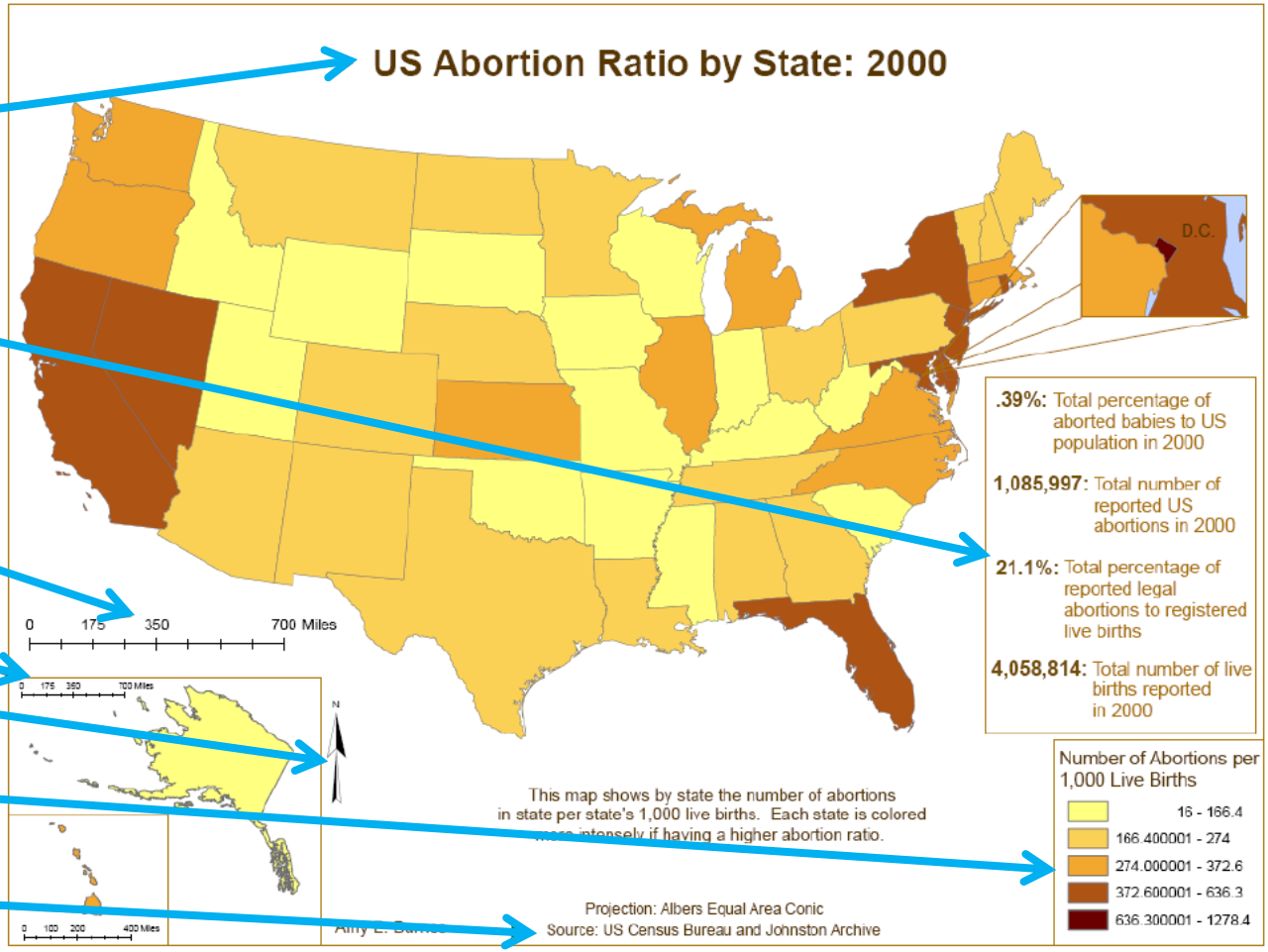
Design, Color, and Typographics

GEOG482 SP2020

Design

Map elements

- Title
- Explanatory text
- Scale
- Inset
- Orientation
- Legend
- Source
- Borders, Contrast and acuity, Alignment, Visual center, and Eye movement

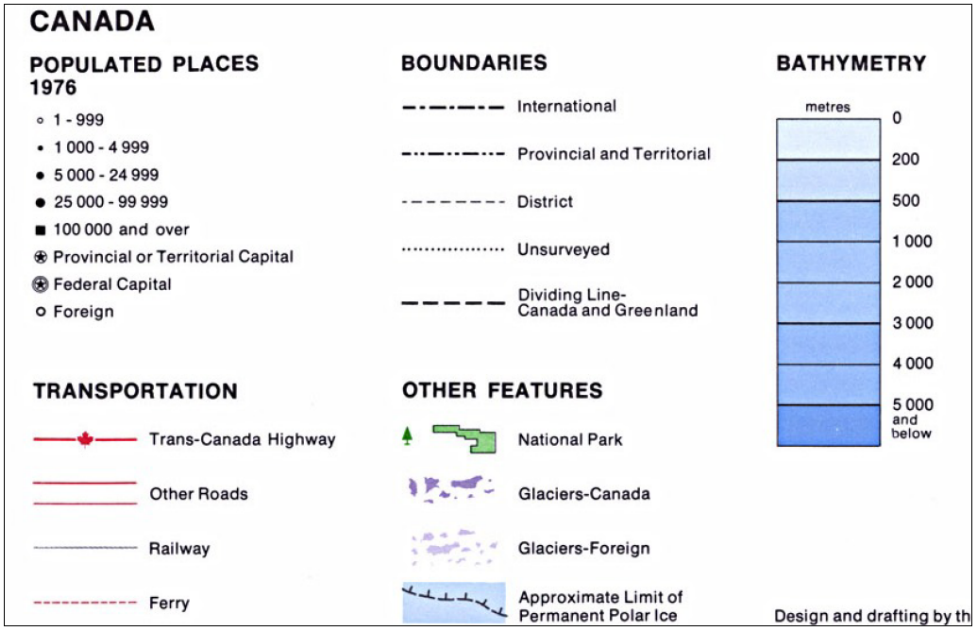


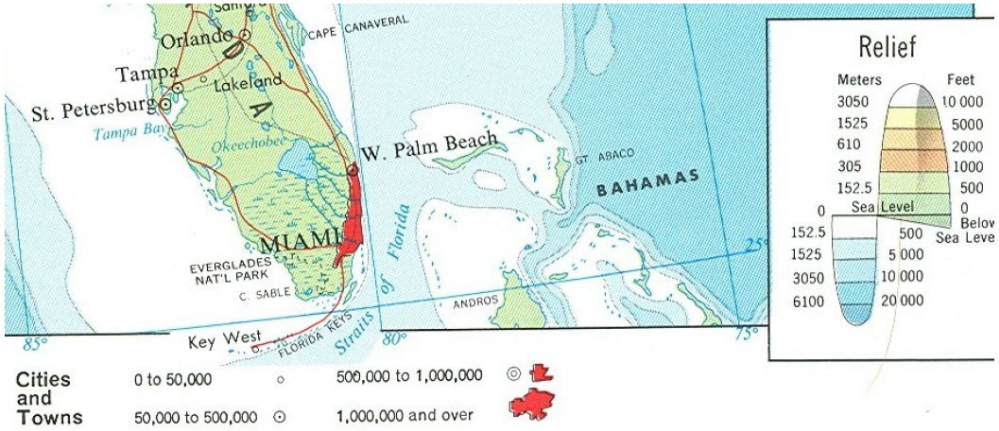
Title

- Map title should try to include:
  - What: the topic of the map
  - Where: the geographic area
  - When: temporal information
  - …usually in that order
- Font size should generally be 2-3 times larger than other text in the map
- Add subtitle in smaller font size for longer titles or more complex map subjects

Legend or Key

- *Legend is key to interpret* your map
- Avoid including obvious symbols and don't include the title "Legend" or "Key"





- Arranged from left to right…
  - *Culture specific*
- Alignment
- Grouping

Ancillary or explanatory text

- Used to communicate some of the important patterns, messages in the map
- Examples:
  - On a historical map, a paragraph setting the historical context, and what happened at important locations
  - On a map of income changes, an explanation that suburban counties are getting richer, and urban counties poorer due to tax cuts
- Somewhat subjective, but so is your map!

Orientation / direction

- Do you need it? - Only if:
  - the map is not oriented with north up
  - the map is of an area unfamiliar to you audience
- Two primary means to give orientation
  - North arrow
  - Graticule
  - Atlas uses?

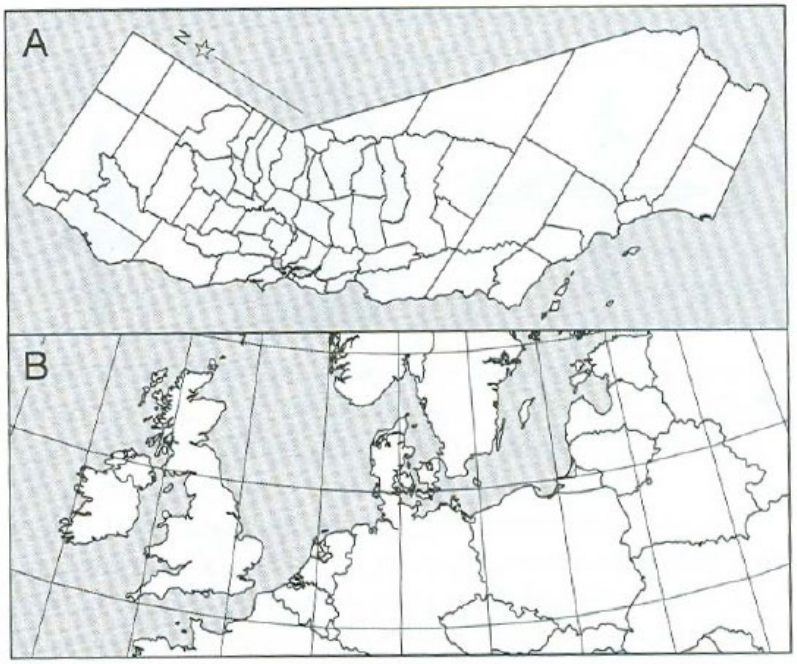


FIGURE 11.16 (A) Use of a north arrow on a map not oriented with north at the top. (B) Meridians of a graticule indicating direction of north.

(Source: Slocum et al. 2009)

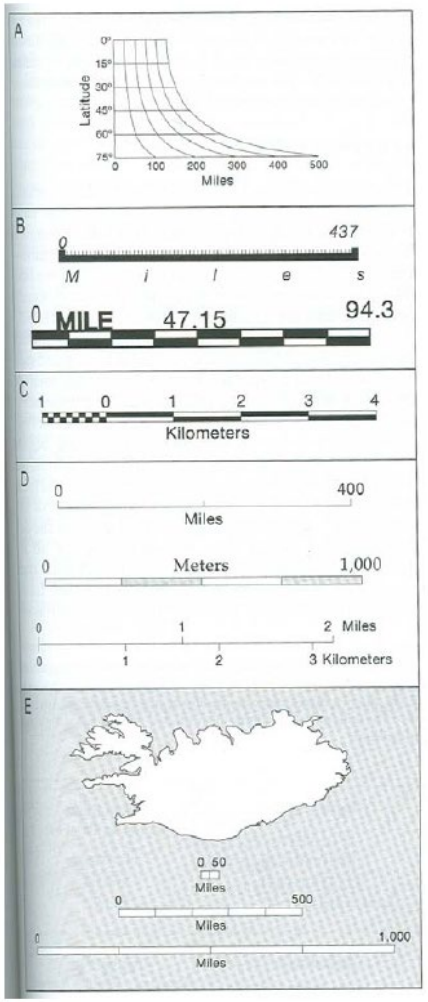
Scale

- an *essential element of most maps* expressed
  - Numerically
  - Graphically
  - Verbally

Scale 1:700 000

0 10 20 30 km

One mm on the map represents 700 m on the earth



- Think about usefulness
  - Size
  - Units, tics
  - Always present? (E.g., Color Plate 24.1)

Sources – credits

- Your map must include
  - Data source(s)
    - Where the data / information came from
  - Map maker, and when it was made
  - Map projection and coordinate systems if this is critical to its use/understanding

- This is "fine print" for the interested

Borders

- A border may help to draw together the elements of the map
  - Frame line – serves as a picture frame surrounding *everything* in the map
  - Neat line – sometimes used to outline the actual map image within the map
- Borders should be subtle and not distract
  - Thin black or grey line often good choice
- *This Dynamic Planet* map…
  - N:\Courses\GEOG482_582\ThisDynamicPlanet.pdf

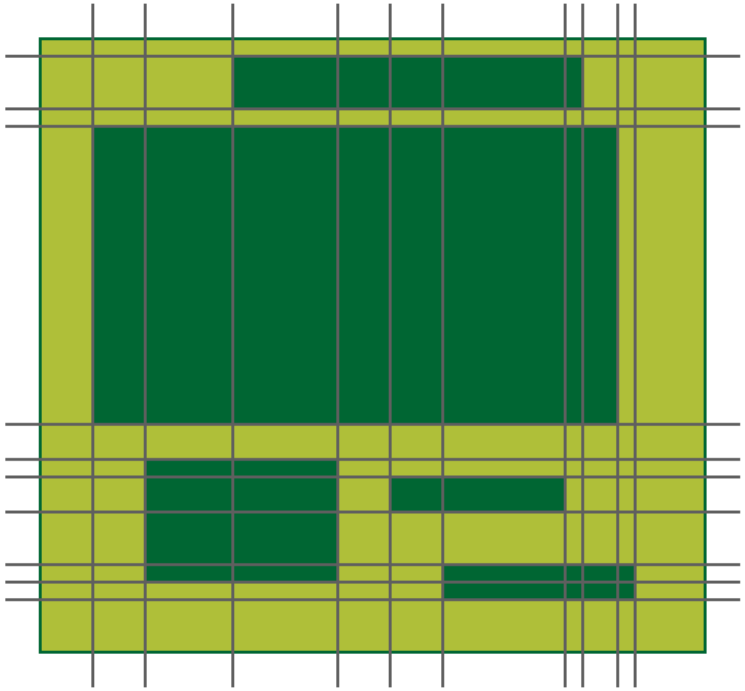
Group Exercise

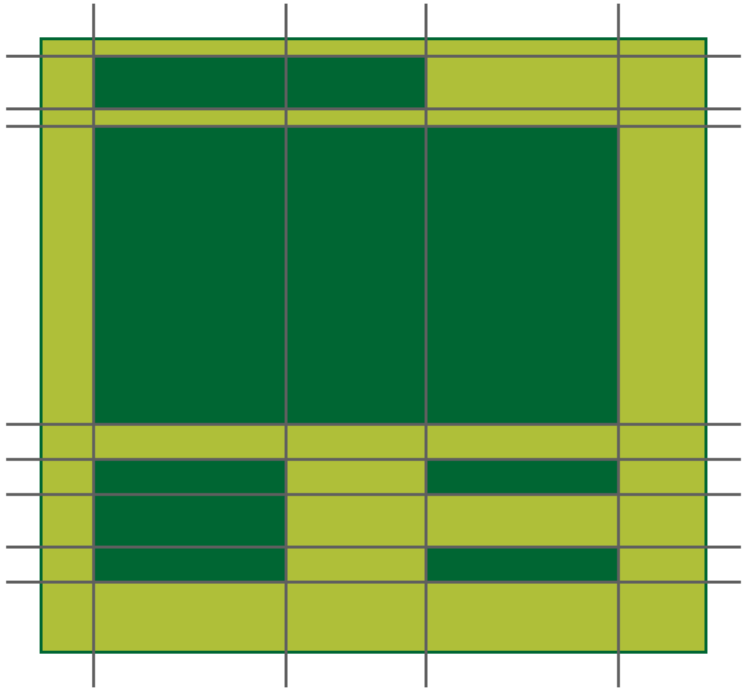
- Q. What kind of map elements can you find from *This Dynamic Planet* map?

- BTW, open your ArcMap now… (will be used soon)

Alignment – Sight lines

- Sight lines are invisible horizontal and vertical lines
- Reducing the number of sight lines, reduces complexity





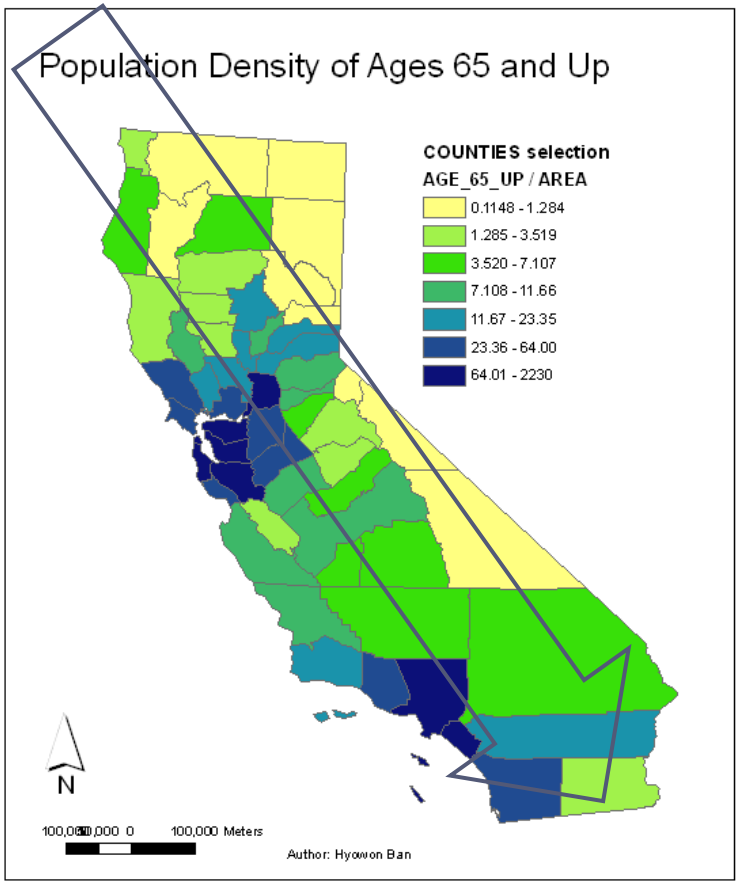
Exercise: Sight lines

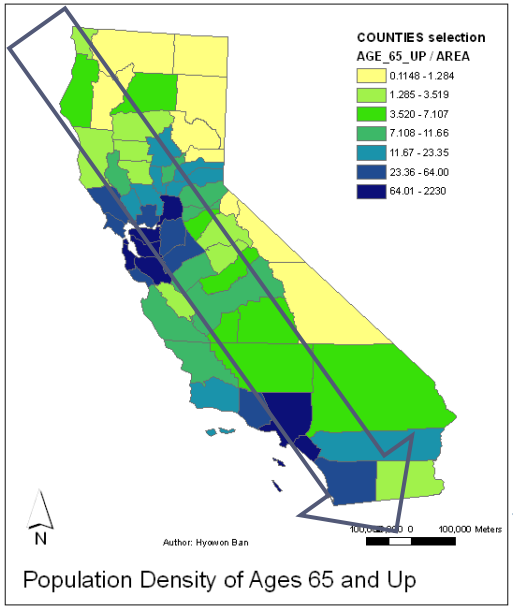
- In ArcMap, let's try to use sight lines and see how it could be useful for your map design.

- In Layout View mode
  - Insert Sight lines by clicking on somewhere on the two rulers.
  - Insert any other map elements (text box, north arrow, etc.)
  - Try to align the map element with one of the sight lines
  - Export your current map (or graphic?) to a PNG image file
  - Open your PNG image file in a viewer
  - Are the sight lines visible?
  - Right click on one of the sight lines and choose a menu to remove it

General layout – eye movement

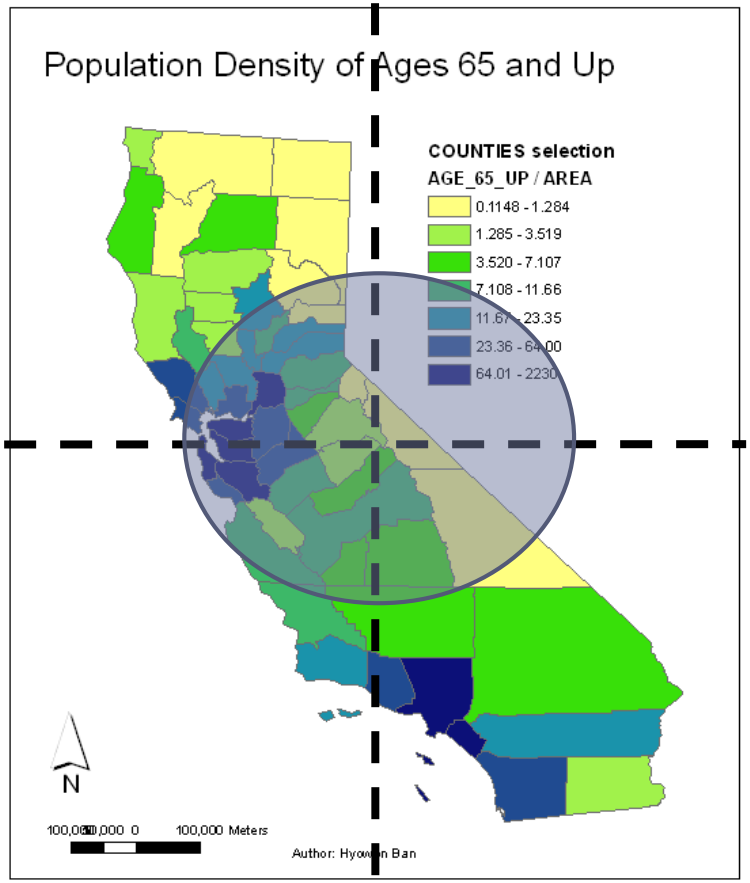
- In general
  - From top to bottom
  - From left to right
- Position map elements accordingly to tell your "story" efficiently

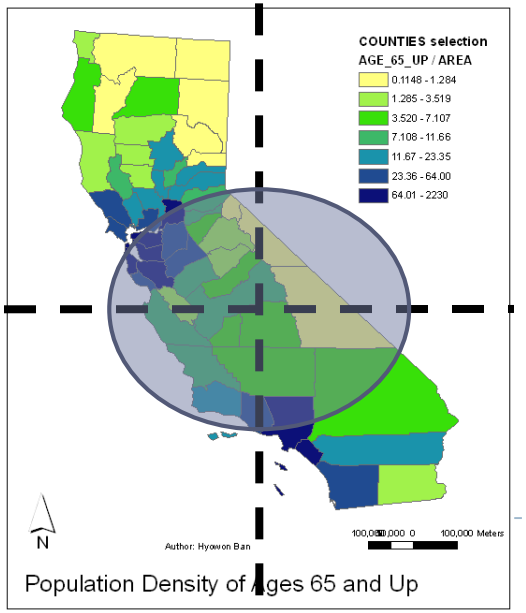




General layout – visual center

- The visual center is located slightly above the actual center
- Centering implies importance





Activity & Break

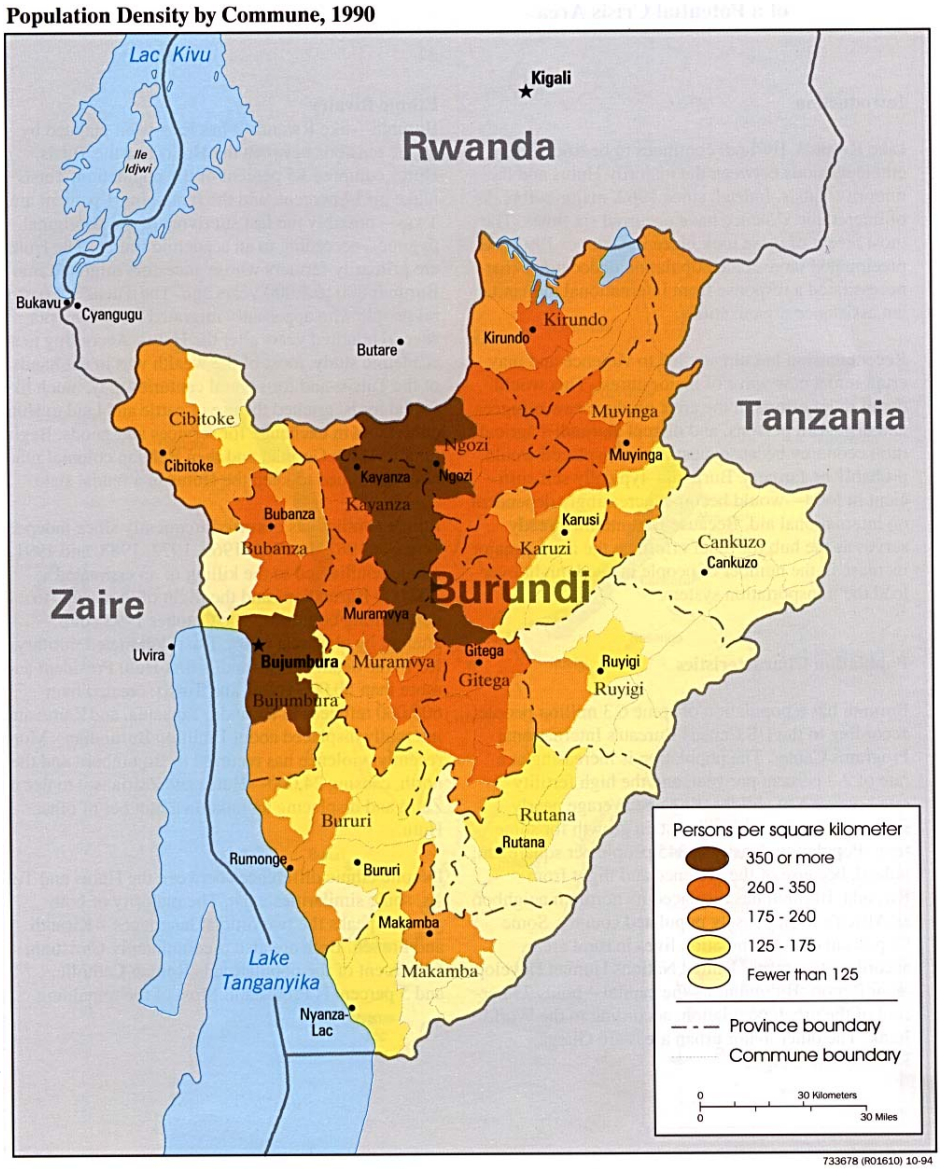
- Groups 1, 2
  - Find two maps from online that shows a good eye movement (1 map) and bad eye movement (1 map): *5 minutes*
- Groups 3, 4
  - Find two maps from online that shows a good visual center (1 map) and bad visual center (1 map): *5 minutes*
- Groups 5, 6
  - Find two maps from online that shows good sight lines (1 map) and bad sight lines (1 map): *5 minutes*
- Share your group's findings after the break

Typical intellectual and visual hierarchy

- Intellectual hierarchy : ranking of importance
- Following Dent
  - 1. Thematic symbols
  - 2. Title, legend, symbols, labeling
  - 3. Base map – land area
  - 4. Important explanatory material
  - 5. Base map – water features
  - 6. Other base elements – labels, grid, scale

Achieving the visual hierarchy

- Figure – ground distinctions
  - Figures *stand out*
    - have form and shape
    - appear to be closer
    - have distinct color
    - are associated with meaning
  - Ground fall into the background
    - appears to continue underneath figures
    - We use various gestalt principles (next slide) and visual contrasts to achieve figure - ground



Source: yumik.bol.ucla.edu; victoriatorf.com

Gestalt Principles

- The meaning of graphic symbols as "unified whole"

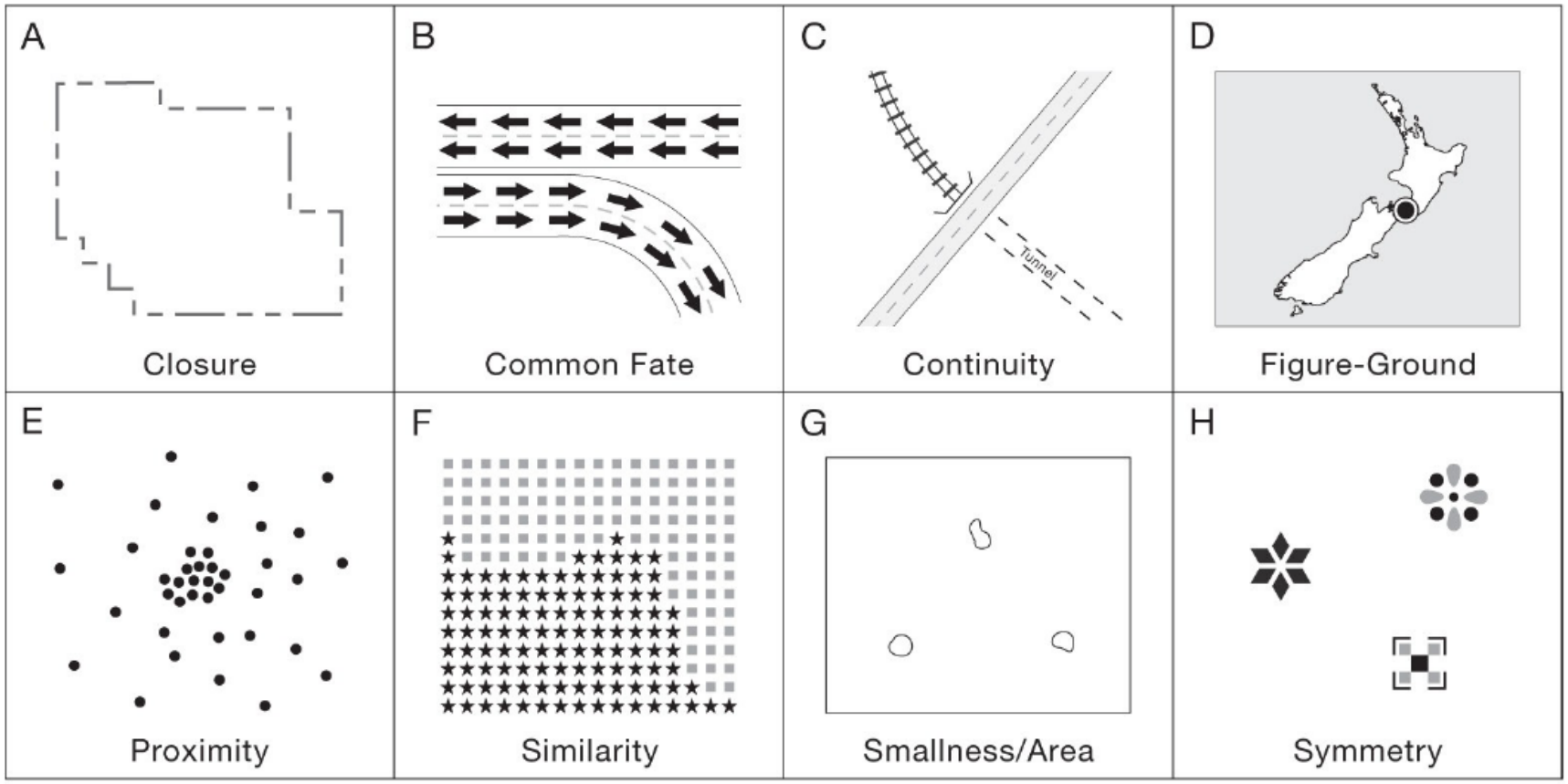
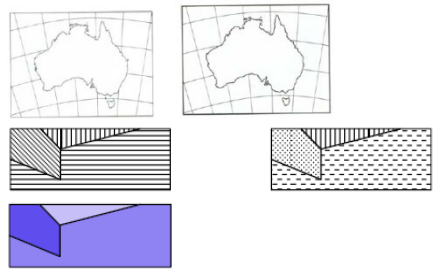
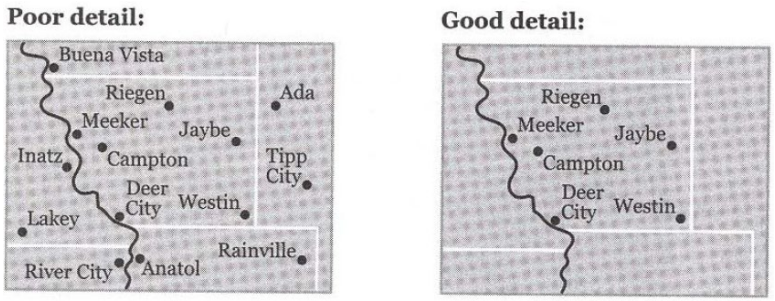
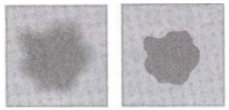


Figure-Contrast, using details and edges

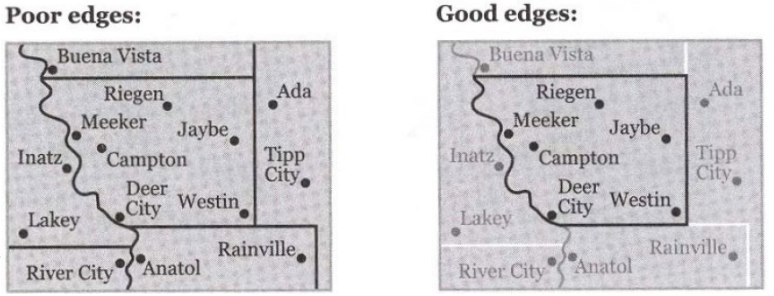
- Figure-Contrast
  - Line/Type weight **difference**
  - Pattern
  - Color value
- Details
  - Lots of details focus attention, creating figure
- Edges
  - Sharp edges create figure
  - White or grey weakens figure





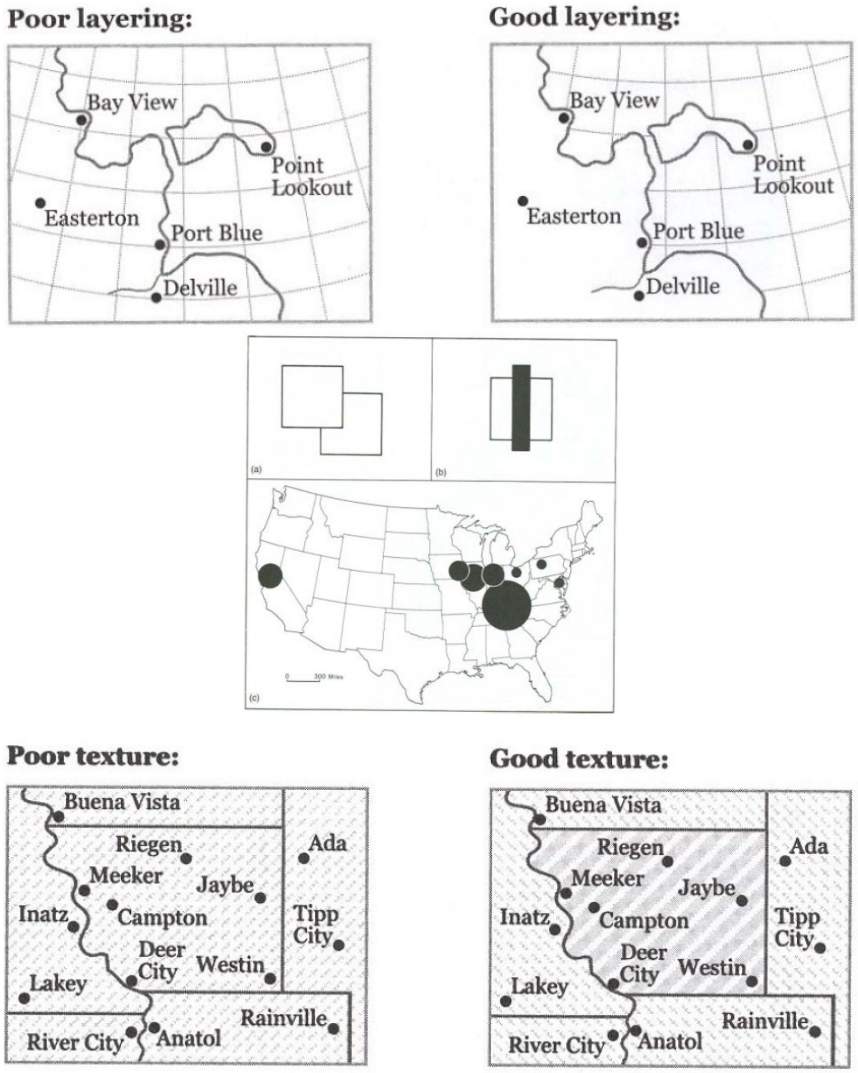


(Source: Krygier and Wood 2005)



Using layering, interposition, and texture

- Layering
  - Sense of continuous surface creates ground
  - Grids can be used
- Interposition
  - Figure is achieved by creating a depth cue
  - Associates to stacked, overlapping objects
- Texture
  - Coarser texture tends to stand out as figure



(Source: Krygier and Wood 2005, Dent 1999)

Typographics

- Map lettering is a functional symbol
  - Aesthetics is secondary

- Symbolization is expressed through
  - Type style *Italic* **Bold** **Roman**
  - Type category Century Century Gothic
  - Type size Large small medium
  - L e t t e r s p a c i n g
  - Placement

Placement

Size and Weight

- Type size
  - Size variation imply ordering
    - Larger size for more important, larger quantities
    - Smaller size for less important, smaller quantities
- Type weight
  - Weight variation imply ordering
    - Bold for more **important, larger quantities (use with caution!)**
    - Regular for less important, smaller quantities
- Keep within 6-24 point for page-size maps
- Use 2-3 point difference and no more than five categories

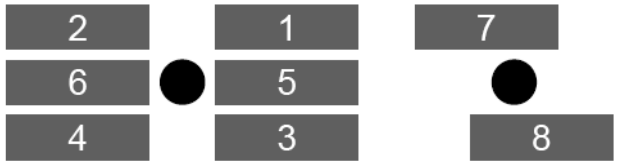
8 pt.
10 pt.
14 pt.
18 pt.
24 pt.

Form and Placement

- Type form
  - Spacing (Kerning)
    - Use for a r e a f e a t u r e s, to fill area
  - Upper case
    - Use for MOUNTAIN RANGES, STATE NAMES
- Type placement
  - Should clarify the relationship between a label and the symbol
  - Placement can reflect characteristics of the feature
    - Label port and harbor towns on the sea
    - Label inland towns on the land
    - Label towns on the side of a river, road they are located
    - Align with graticule if this is included

Labeling

- Point features
  - Work outward from the center of the map
  - Position priorities
    - Slightly different between books



- Line features
  - Curve the type to follow the symbol
  - Position priorities
    - Keep it above and horizontal if available
    - Repeat label for very long features

(Think about position priorities for point features)

- Areal features
  - Curve and fit text to the area
    - To create a clear association between text and area
  - Keep labels horizontal if possible and away from borders
  - Avoid hyphenation
  - If area is to small to fit text inside – use point conventions

Group activity (5 minutes)

- Create a map using the map elements below based on the concepts introduced in today's lecture. FYI, you can modify size of the provided map elements as well as add any other map elements not provided here (map not to scale).

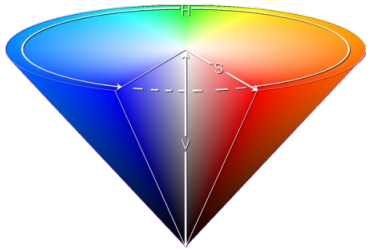
Title of the map

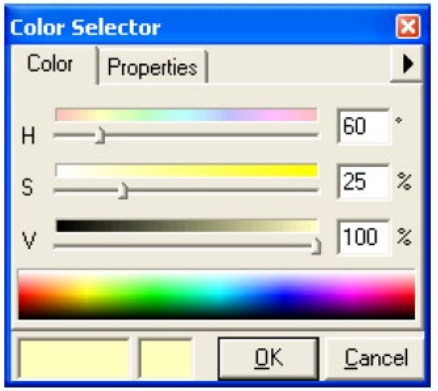
(Legend)

Author, date of map production, data sources

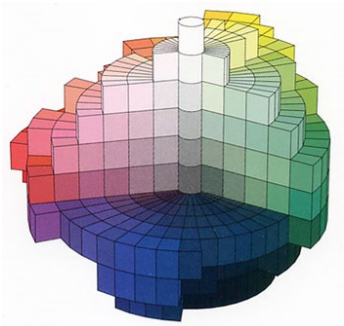
Color models – perceptual systems

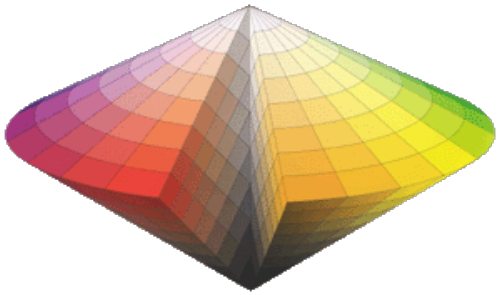
- Hue, saturation, value (HSV)
  - Hue (color) distributed 0-360°
  - Saturation (pigment) 0-100%
  - Value (lightness) 0-100%





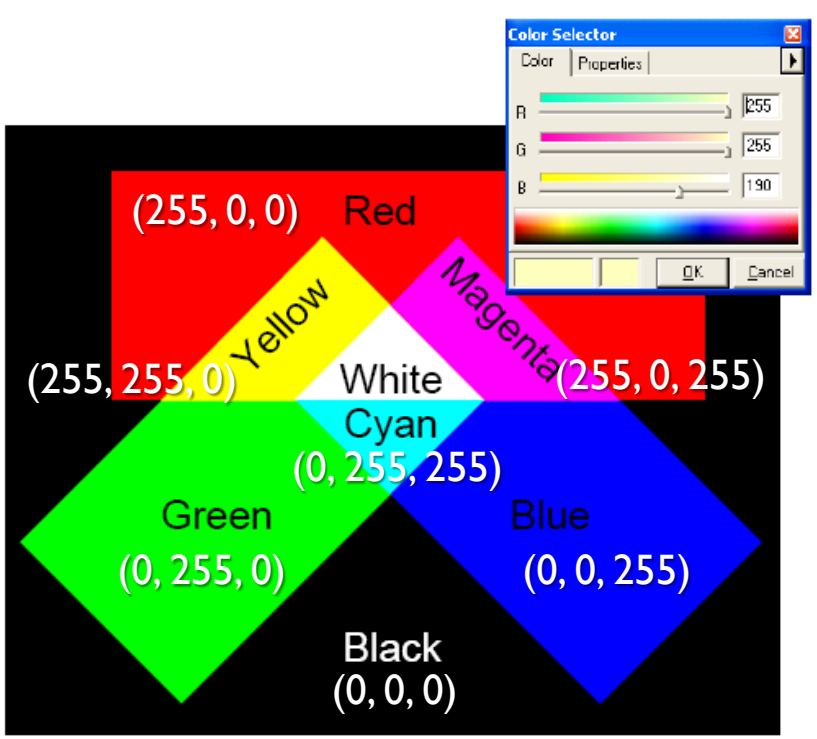
- Munsell, Ostwald
  - Similar to HSV, but more user-oriented
  - Each color is perceptually different (ex. next slide)
  - One step "equally" different





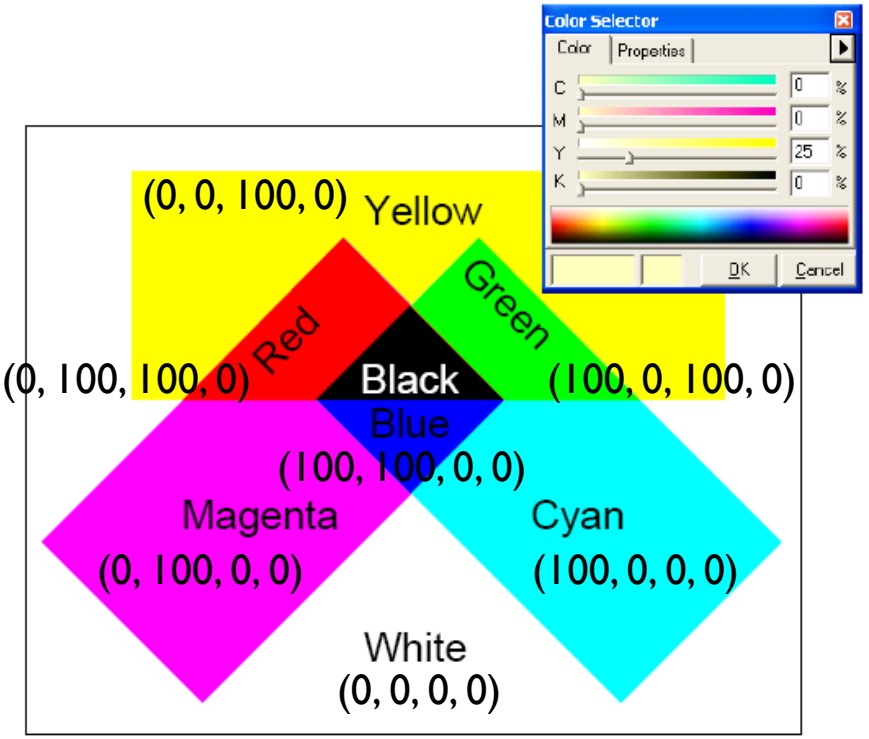
(sources: http://andrewharvey4.files.wordpress.com/2009/08/450px-hsv_color_cone.png, Slocum et al. 2009, http://3.bp.blogspot.com/_jNfLasUQDFg/R4sP2suLg4I/AAAAAAAAAgU/joKqubbLKbA/s400/munsell.jpg, http://3.bp.blogspot.com/_UvYtTQ2owUw/SwW_NcSCA2I/AAAAAAAAAGE/ZI-1dxXiH70/s320/c_ostwald[1].gif.)

Color models – process systems



Additive colors (RGB)

(start adding from black: 0, 0, 0)

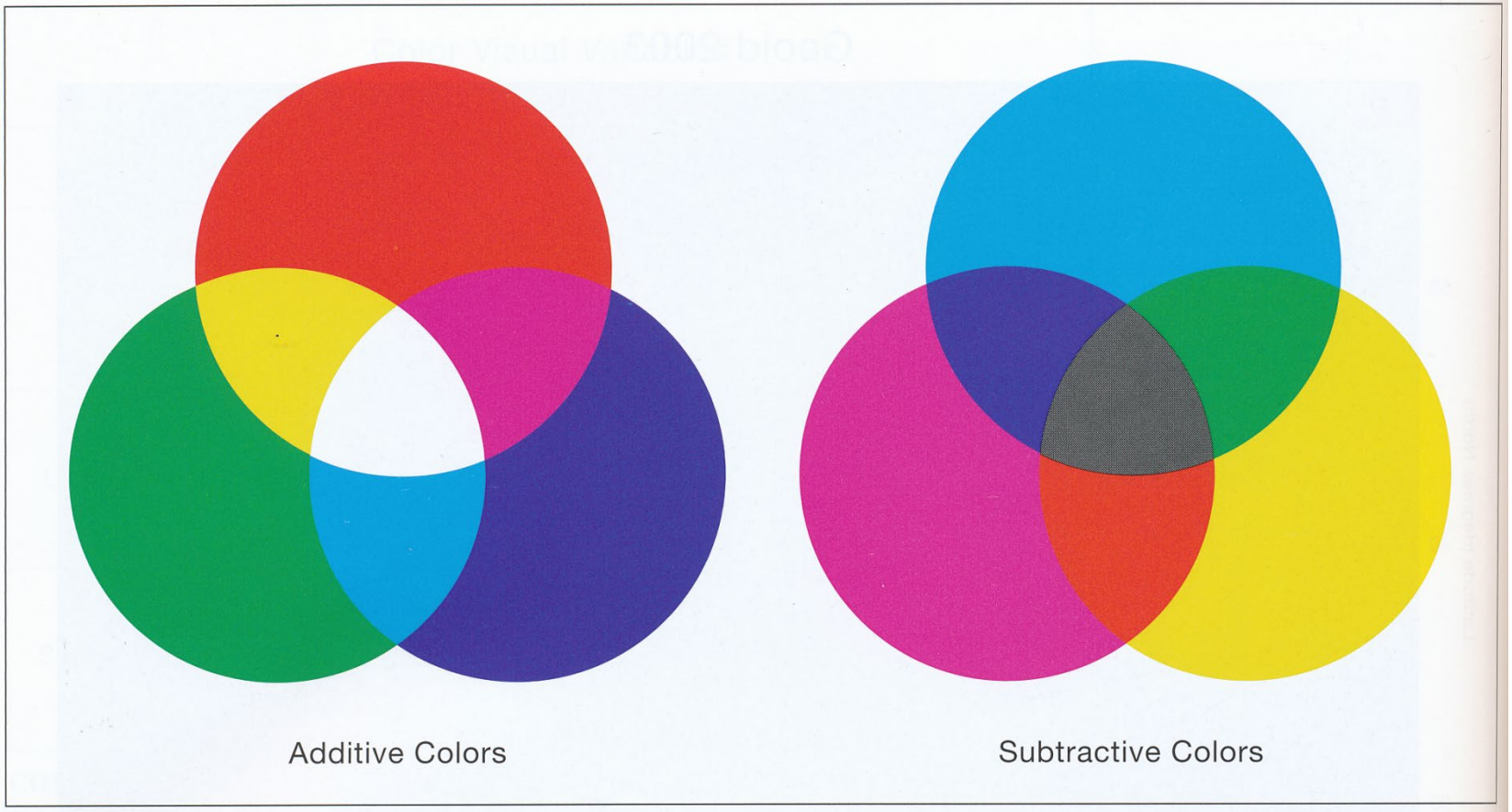


Subtractive colors (CMYK)

(start subtracting from black: 100, 100, 100, 100)

- These are either mixed or dithered

Color models – RGB vs. CMYK



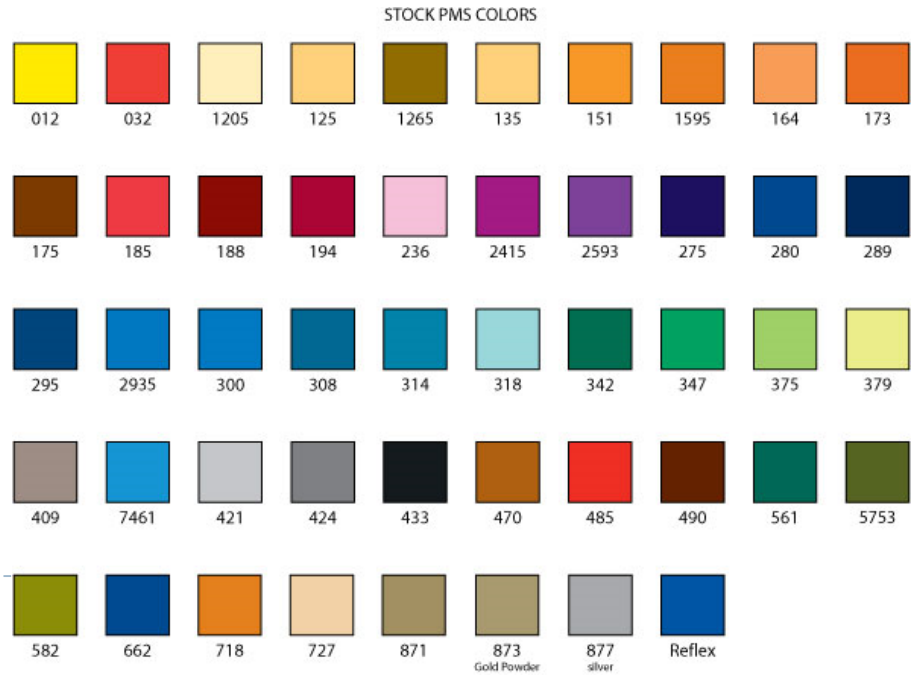
COLOR PLATE 10.1 Principles of additive and subtractive color. For additive color, overlapping red, green, and blue lights reveal how cyan, magenta, yellow, and white can be created. For subtractive color, the reverse is the case: cyan, magenta, and yellow combine to produce red, green, blue, and black. To obtain a true black with subtractive colors, it is often necessary to add a black layer.

So, it is CMY"K"

- (source: Slocum et al. 2009)

Color models – spot colors

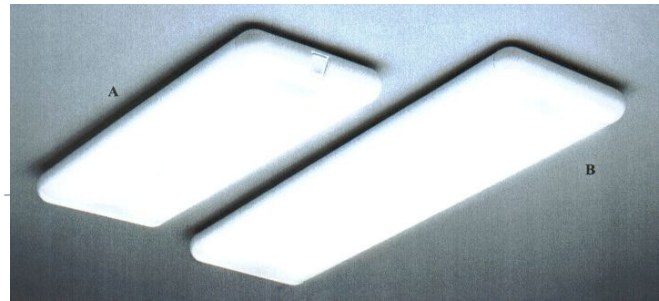
- Should give you *WYSIWIP, or*
  What You Select Is What Is Printed
- No dithering → less impact of screen-matching mistakes
  - E.g., washed-out colors on a screen due to a projector and/or lighting
- Can produce special colors
  - E.g., metallic gold, silver, and neon-like colors
- PANTON color system



(source: http://www.giftvipcards.com/vipcardpricing.asp)

Some guidelines – light source

- Same printed-color will look different when viewed under different conditions
- Light source
  - Intensity
    - Low-intensity: use intense, saturated colors
    - High-intensity: use less intense, less saturated colors
  - Incandescent vs. fluorescent lights
    - Look critically under lighting conditions similar to what your target audience will have
      - E.g., presentation using a projector and a screen



Some guidelines – map surface

- Paper type
  - Glossy paper – bring out colors intense, vibrant
  - Matte paper – makes colors less intense, dulled
- Media
  - Computer monitor
    - makes colors intense, vibrant
    - usually does not rely on reflection
  - Projector
    - can be unpredictable
    - depends on the projector
    - relies on neutral reflection

- http://colorbrewer.org *could be helpful for more guidelines and tips*

Qualitative conventions

- Blue for water
- Red = warm, Blue = cold temperature
- Yellow and Tan for dry and sparse vegetation
- Brown for land surfaces, also contours
- Green for thick, lush vegetation

Quantitative suggestions

- Binary
  - One hue and lightness step
- Qualitative
  - Hues of similar lightness
- Sequential
  - Lightness of grays
  - Lightness of one hue
  - Lightness with spectral transition
- Diverging
  - Two hues diverging from midpoint
- https://www.washingtonpost.com/news/wonk/wp/2016/04/11/the-dirty-little-secret-that-data-jou

Image source: http://colorbrewer.org

Group Activity

- With your group member, search the web and find a temperature map that has sequential color scheme and another temperature map that has diverging color scheme.
- Discuss whether the color scheme of each map is appropriate or not.
- Share your group's findings with other people.

For next time…

- Reading
  - Ch. 14

- Test1
  - On Feb. 25
  - Study guide and sample questions available on the BeachBoard